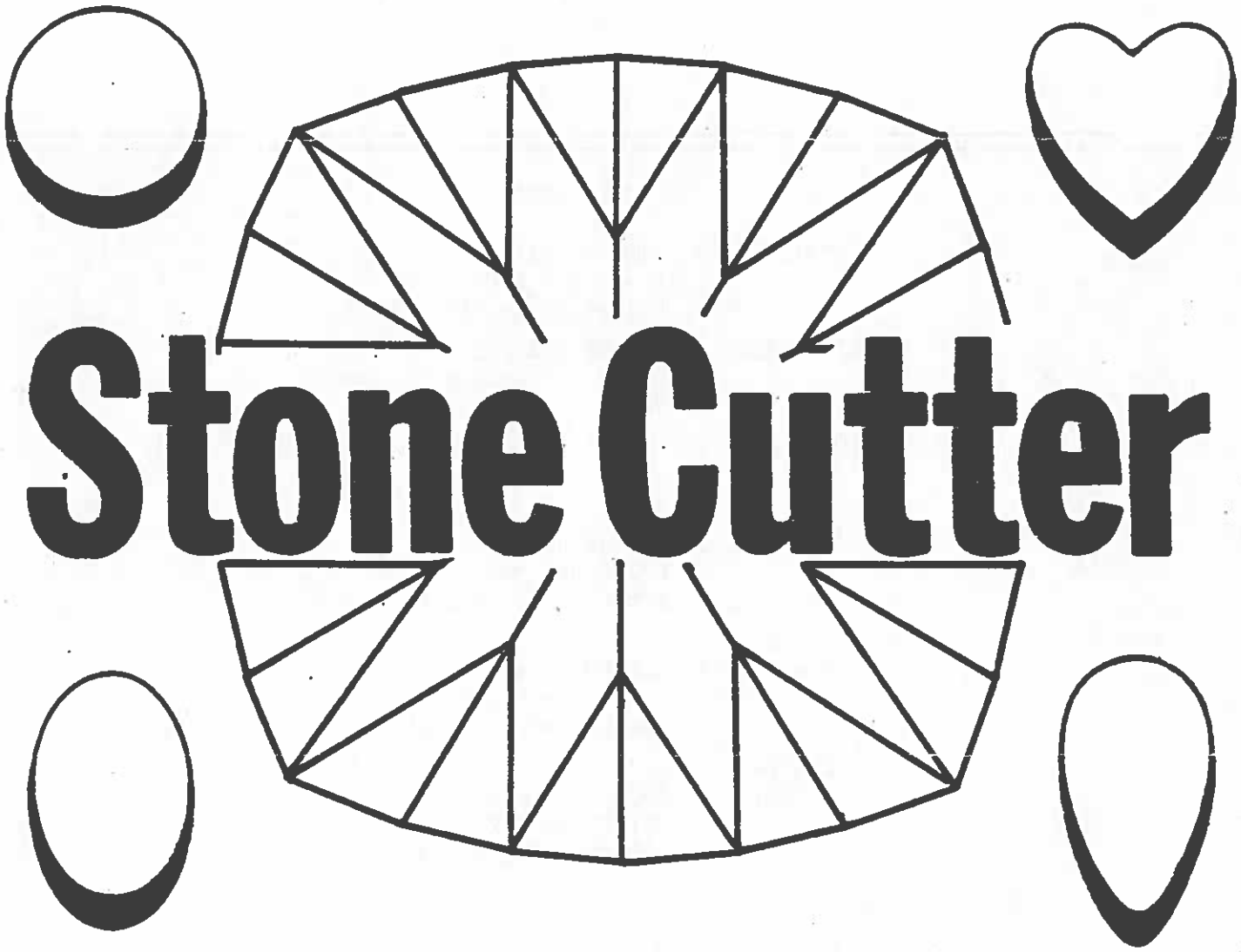
NORTH CAROLINA LAPIDARY SOCIETY

January 1983



Stone Cutter

MEETINGS: *SUNDAY*
Third ~~Thursday~~ each month.
GEMCRAFTERS
2106 Patterson St.
Greensboro, NC 27407

SOUTHEAST FEDERATION MINERALOGICAL SOCIETIES, INC.

MEETING DATE : January 16, 1983

TIME : 2:30 PM

PLACE : GEMCRAFTERS
2106 Patterson St.
Greensboro, NC

PROGRAM : GEMSTONE INCLUSIONS

A slide program presented by Roy Greene.

OFFICERS 1983

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Liberty, NC 27298

EXECUTIVE BOARD meets at the call of the president.

MEMBERSHIP DUES : $12.00 per year - prorated quarterly.

STONE CUTTER subscriptions: $5.00 per year.

STONE CUTTER advertising rates: full page, $40.00: half page $20.00; quarter page, $10.00.

FROM THE PRESIDENT -

TO ONE AND ALL FOR 1983 - Our Society extends to you a Most Happy, Healthy, and Rewarding New Year. Also, to our STONE CUTTER subscribing friends please feel free to visit with us any time that your schedule permits.

Sincerely,
John Bayer
Pres.

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SOUTHEAST FEDERATION OFFICERS FOR 1983

Elected at the convention in St. Petersburg, FL in November, the following persons will serve the Southeast Federation in the positions shown for the year 1983.

President	Harold Sparks
1st VP	Andy Clark
2nd VP	Bob Pflegl
Secretary	Miriam Smith
Treasurer	Milton Braun
Asst. Treas.	Wilbur White
Lodestar Editor	Leo Morris
Wildacres Dir.	Clay Watkins

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DID YOU KNOW ?

The ring worn by the Pope is an Emerald, cut from a huge stone stolen from the Incas by Pizarro. It was cut and mounted into a ring and presented to the Pope, and the stone has been worn by the Popes ever since. The emerald was a symbol of royalty in Peru, and as the Inca was supposed to be a son of the Sun-God, those gems were symbolic of the sun and could only be used by members of the royal family or the high priests. Bishops usually wear Amethyst rings, but it is not compulsory and is customary merely because its purple color is the official color of the Bishops' robes. The same is true of the Ruby rings of the Cardinals.

from The Anclote Scoop.

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AN ERROR -

A reader points out that in the cutting instructions for the Ultra Tec Trophy stone (STONE CUTTER, Dec. '82), index settings for the $42\frac{1}{4}$ and $29\frac{1}{2}$ degree facets should be 8 - 16 - 24 etc.

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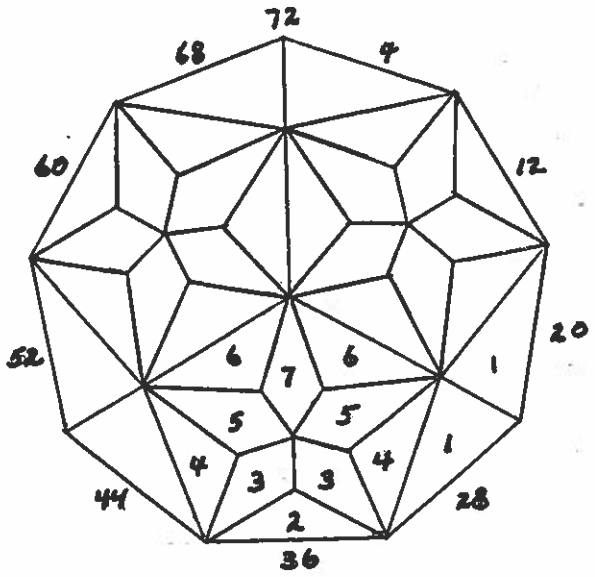
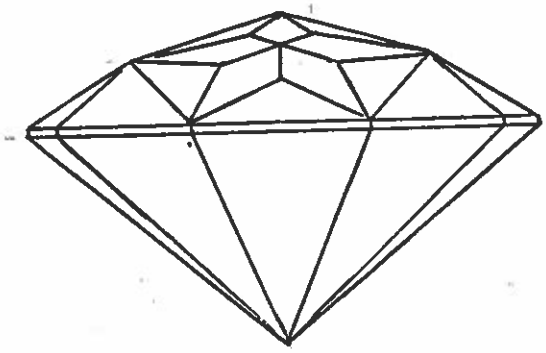
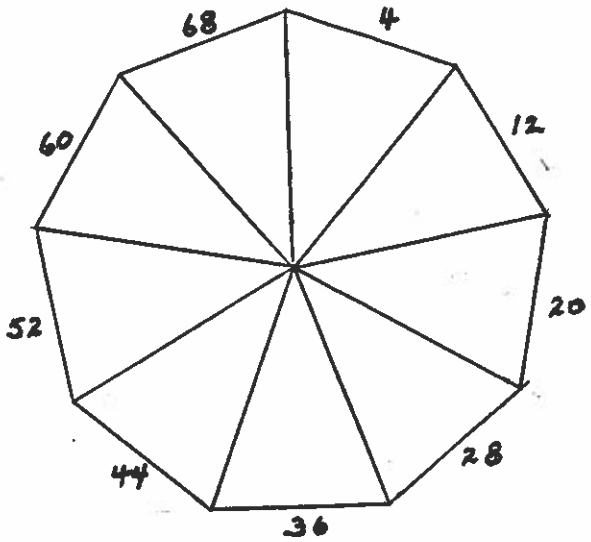
3-STAR GENERAL

by PAUL C. SMITH
8415 West 88th St.
Indianapolis, IN 46278



CROWN





PAVILION

3-STAR GENERAL - Cutting instructions.

Paul Smith, a frequent contributor to STONE CUTTER, submits the 3-STAR GENERAL with the following comments:

"Star cuts seem to be all the style nowadays, with American Star for CZ, Star of David, Czarina Star, and several others. So, here's yet another one. The pavilion is a piece of cake, but the crown will give your techniques a good workout."

"There are no stars evident in the light pattern returned; the fun is in the challenge of cutting the geometrical pattern of the crown.* Viewed under multiple light sources..."it knocks your eye out with the brilliant fiery flashes. Such dispersion!"

CUTTING ORDER - Girdle, crown and pavilion. 72 index. Angles are for CZ.

GIRDLE

Cut at 90°, indexing 4-12-20-28-36-44-52-60-68.
Cut to same stop, giving equal sides.

CROWN

Compound + means compound toward next higher index number. Compound - means compound toward the next lower index number.

STEP	ANGLE	INDEX	COMMENT
1.	38.2°	68-4, 20-28, 44-52	
2.	39.2°	12-36-60	
3.	33°	10-34-58	Compound + 1.1°
		14-38-62	Compound - 1.1°
4.	32.8°	6-30-54	Compound - 2.4°
		18-42-66	Compound + 2.4°
5.	21.2°	6-30-54	Compound + .6°
		18-42-66	Compound - .6°
6.	13°	70-2, 22-26, 46-50	
7.	12°	12-36-60	Slight angle adjustment may be necessary.

Polish in same order as cutting.

PAVILION

STEP	ANGLE	INDEX
1.	41°	4-12-20-28-36-44-52-60-68

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CUT-AND-TRY FACET DESIGNING

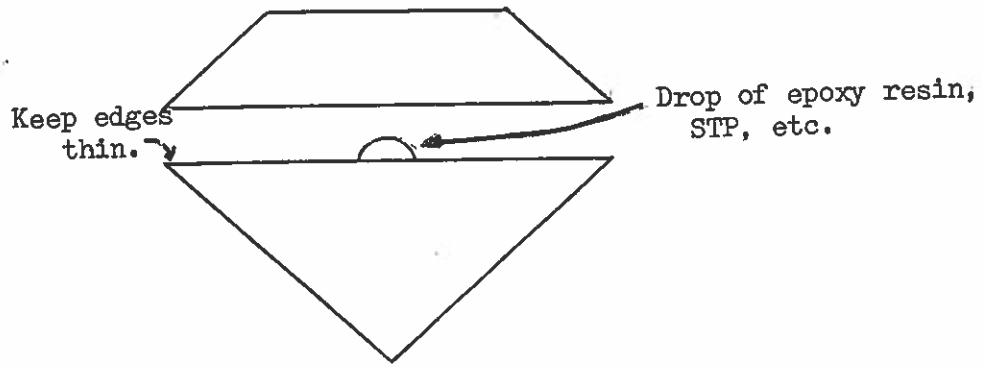
by Paul C. Smith

The scientific approach to facet designing involves figuring angles and indexing, using trig formulas and allowing for such important considerations as refractive index, critical angle, etc. In this manner it is possible to come up witha design that is sure to be cuttable. But because of the number of variables involved, the designer is still not able to predict how successful the result will be from a standpoint of optical performance. Only the actual cutting will show that.

The other approach, which might be called the cut-and-try method, would be to start at the faceting machine, and, using the knowledge acquired from months or years of faceting experience, to work out the angles and indexing as you go.

Both methods have their advantages and disadvantages, and actually a combination of both should give the best results. Although the author relies heavily on the mathematical approach, he does not hesitate to use cut-and-try methods if needed. For example, often when a new design has been calculated and cut, even though the results are fairly satisfactory he still comes down with a bad case of "what ifs". "What if I increase the crown angles a wee bit-- or decrease the pavilion angles a little?" "Would that improve or worsen the pattern?" To get the answer would ordinarily mean cutting several more complete stones-- and that's what this article is about.

The solution is to cut separate crowns and pavilions and combine them for the final result. As shown in the diagram below, the crown and pavilion can be assembled with a drop of some suitable liquid between them.



When crown and pavilion are pressed together, the liquid spreads and eliminates any air layer between them. This avoids reflections at the girdle plane. I use

CUT-AND-TRY FACET DESIGNING (con't)

a drop of epoxy resin from a 2-part epoxy mix - don't mix the hardner with it unless you don't want to take them apart. That would defeat the test. Other liquids might be suitable - STP, honey, or similar liquids. Water is not viscous enough and evaporates quickly.

One disadvantage of this method is that you have to cut two large "facets" at the girdle plane - one on the crown and one on the pavilion. However they do not need to be highly polished. The wetting action of the liquid allows the light to go through freely. I cut these two large surfaces first and then dop to them to cut the crown and pavilion.

Now for the advantages. Suppose that you cut three crowns, all with slightly different main angles, and three pavilions, also with slightly different main angles. Other facet angles are adjusted according to the mains. When you go to assemble crowns and pavilions you have 9 possible combinations. In other words, by cutting the equivalent of 3 complete stones (a crown and pavilion, plus the two girdle plane facets at their junction) you have the privilege of viewing 9 facet designs! The number of possible combinations is equal to the square of the number of crowns and pavilions cut: 4 crowns and 4 pavilions = 16 combinations; 5 crowns and 5 pavilions = 25 combinations - and so on.

A disadvantage is that you can't make a direct comparison between two combinations; you have to remember how the first one looked and go on to the next. However if you think you have it narrowed down to two choices you can always make a duplication of crown or pavilion as the case may be. For example, if you had it down to either crown #1 + pavilion #2 or crown #1 + pavilion #3, make a duplicate of crown #1 and then you can make a direct comparison. This might not seem worthwhile unless you thought you were on to something really super.

Another advantage of this system is that you can rotate the crown with respect to the pavilion and see the results. Sometimes the results are surprising. Contrary to some preconceived ideas, it is not always bad to stagger the crown and pavilion mains.

The system can be extended by varying other factors; for example you can try combining step-cut or fan-cut crowns with brilliant style pavilions, or vice versa. All this without having to cut so many complete stones. You may think of other possibilities. The field is wide open.

Naturally, you would not want to experiment with expensive material. Quartz is cheap and will serve pretty well for the low refractive index range; high-lead glass does pretty well in the higher ranges. You might even want to use CZ if you thought the design justified it.

How much should you vary the angles on crowns and pavilions? I find that a small change in pavilion angles has more effect than the same change in crown angles. Therefore, for example, your choice for pavilion angles might be 40, 41 and 42 degrees, and crowns could be, say, 36, 39 and 42 degrees. As mentioned earlier, this gives you 9 combinations. Happy experimenting.

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